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(54) **Structure of an illumination type key top.**

(57) An illumination type key top having a button, a key seat, a key switch including a contact portion, and a light source. When the button is pressed, it presses the contact portion of the key switch via the key seat to cause the light source to emit light. The button and key seat are affixed to each other by adhesive, and each is made of a light transmitting material. A character or similar information is printed on the rear surface of the button such that the light is transmitted only through the character.

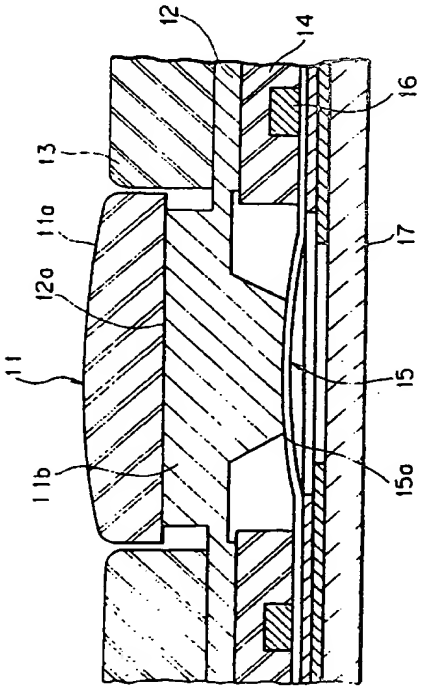

Fig. 2

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BACKGROUND OF THE INVENTION

The present invention relates to the structure of an illumination type key top applicable to various kinds of equipment and, more particularly, to the structure of a button portion of an illumination type key top made of a plastic.

A key top capable of displaying a character or similar information on the top of a button when the button is pressed is extensively used with various kinds of equipment including electronic equipment. Typical of such a key top is a character illumination type key top which illuminates only a character portion to be displayed. This type of conventional key top includes convex portions, concave portions, flanges and so forth and is produced by the bicolor molding or transfer molding of a plastic to allow only the character portion to transmit light.

However, a problem with the conventional character illumination type key top is that the convex surface, portions, convex portions and flanges obstruct the decrease in the thickness and cost of the key top. In addition, the bicolor molding or transfer molding of a plastic further increases the cost. To eliminate these problems, a method which provides the surface of the button with a coating and then removes part of the coating for forming a character is available. This method, however, brings about other problems, e.g., that the satisfactory wear resistance is not achievable due to the processing effected on the front surface, and that the tonality available for characters are limited.

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a simple, thin and inexpensive illumination type key top.

It is another object of the present invention to provide an illumination type key top whose surface is highly resistive to wear.

It is another object of the present invention to provide an illumination type key top allowing a character to be provided with a color of any tonality.

A key top capable of displaying predetermined information when illuminated by light issuing from a light source built in the key top of the present invention comprises a button made of a light transmitting plastic, a key seat made of a light transmitting elastic material and affixed to the button, and a key switch for radiating the light from the light source by being operated by the button via the key seat when the button is pressed.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will become more apparent from the following detailed description taken with the accompanying drawings in which:

FIG. 1 is a section showing conventional key top; and

FIG. 2 is a section showing a key top embodying the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

To better understand the present invention, a brief reference will be made to a conventional character illumination type key top, shown in FIG. 1. As shown, the key top has a button 21, a key seat 22, a front cover 23, a light conducting plate 14, a key switch 15, a light source in the form of a light emitting diode (LED) 16, and a support plate 17. The button 21 has a convex front surface 21a, a concave rear surface 21b, and a flange 21c extending sideways from the button 21. The key seat 22 has a convex front surface 22a and a concave rear surface 22b. The rear surface 21b of the button 21 contacts the front surface 22a of the key seat 22 while the flange 21b of the button 21 abuts against the rear surface of the front cover 23. The rear surface 22b of the key seat 22 is urged against a diaphragm or similar contact portion 15a included in the key switch 15. In this configuration, the button 21 is securely positioned and prevented from coming off.

The button 21 is formed by the bicolor molding or transfer molding of a plastic to allow the light from the LED 16 to be transmitted only through a character portion thereof. This provides the key top with a character illumination type structure. The key seat 22 is implemented as a molding of silicone rubber to transmit light therethrough. Specifically, light issuing from the LED 16 is sequentially propagated through the light conducting plate 14 made of a transparent plastic or similar material, key seat 22, and button 21. On the surface 21a of the button 21, only a character portion appears bright. The front cover 23 is formed of a material which shields light.

The conventional key top described above has some problems left unsolved, as follows. The button 21 has to be provided with the convex front surface 21a and concave rear surface 21b while the key sheet 22 has to be provided with the convex front surface 22a and concave rear surface 22b. This obstructs the decrease in the thickness and cost of the key top. In addition, the bicolor molding or transfer molding of a plastic further increases the cost.

Referring to FIG. 2, a key top embodying the present invention is shown which is free from the problems stated above. As shown, the key top is made up of a button 11 made of a light transmitting plastic, a key seat 12 located beneath the button 11 and implemented as a molding of light transmitting silicone rubber, a front cover 13 made of a light shielding

material and pressing the key seat 12, a light conducting plate 14 made of a transparent plastic or similar material, a key switch 15 contacting the underside of the key seat 12, a light source in the form of an LED 16 buried in the plate 14, and a support plate 17 on which such constituents are mounted. The key switch 15 includes a diaphragm or similar contact portion 15a. When the top 11a of the button 11 is pressed, it presses the contact portion 15a of the key switch 15 via the key seat 12, thereby causing the LED 16 to emit light. Both the rear surface 11b of the button 11 and the front surface 12a of the key seat 12 are formed flat. These surfaces 11b and 12a are connected together by adhesive to affix the button 11 and key seat 12 to each other. Subsequently, the support plate 17, key switch 15, conducting plate 14, key seat 12, button 11 and front cover 13 are sequentially assembled in this order, as named from the bottom. By adhering the button 11 to the key seat 12, it is possible to provide the button 11 with an extremely simple configuration.

To provide the key top with a character illumination feature, light shielding ink may be applied to the rear surface 11b of the button 11 by printing while leaving a character portion blank. When it is desired to provide the character with color, ink of light transmitting color may be applied to the light shielding ink by printing. The key seat 12, like the conventional key seat, is constituted by a molding of light transmitting silicone rubber and provided with a light shielding layer by painting or printing except for the surface 12a thereof which contacts the button 11.

In the above configuration, light issuing from the light source 16 is sequentially propagated through the light conducting plate 24, key seat 12, and button 11. On the top 11a of the button 11, only a character portion appears bright.

In summary, it will be seen that the present invention provides a simple, thin and inexpensive key top. Further, since the key top of the invention has a character printed on the rear surface of a button, it is free from various problems ascribable to wear, e.g., defacing of the character. In addition, the character can be colored in any desired tone so long as the color transmits light.

Various modifications will become possible for those skilled in the art after receiving the teachings of the present disclosure without departing from the scope thereof, as defined in the appended claims.

Claims

1. A key top capable of displaying predetermined information when illuminated by light issuing from a light source built in said key top, comprising:

   a button made of a light transmitting plastic;

   a key seat made of a light transmitting elastic material and affixed to said button; and

   a key switch for radiating the light from the light source by being operated by said button via said key seat when said button is pressed.

2. A key top as claimed in claim 1, wherein said button is connected at a rear surface thereof to a front surface of said key seat by adhesive.

3. A key top as claimed in claim 2, wherein the predetermined information comprises a character printed on said rear surface of said button.

Fig. 1

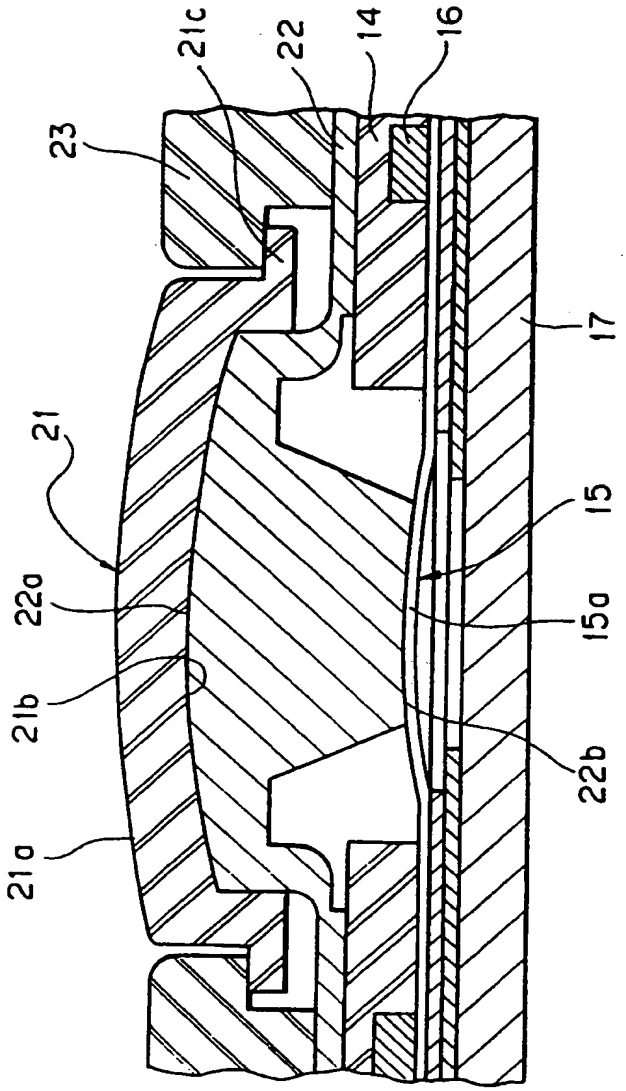

Fig. 2